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(FILE 'HOME' ENTERED AT 10:11:54 ON 11 JUL 2001)  
FILE 'CA' ENTERED AT 10:12:08 ON 11 JUL 2001  
L1 1532 S (SAMPLE OR VACUUM OR SLUICE) (3A) (VALVE OR LOCK OR DOOR)  
L2 123 S L1 AND MASS SPECTRO?  
L3 565 S (LOAD? OR UNLOAD?) (3A) (VALVE OR LOCK OR DOOR)  
L4 14 S L3 AND MASS SPECTRO?  
L5 131 S L2, L4  
L6 102 S L5 NOT PY>1994  
L7 13 S L5 NOT L6 AND PATENT/DT  
L8 8 S L7 AND (LASER OR PREPARING/TI OR 1995/PY OR 1996/PY)  
L9 1907 S L1, L3 NOT L5  
L10 4 S L9 AND SAMPLE (3A) (TRAY OR SUPPORT OR PLATE)  
L11 2 S L10 AND (SAMPLE POSITIONING OR EXCHANGE) /TI  
L12 2852 S PRESSURE (3A) (VALVE OR LOCK OR DOOR)  
L13 28 S L12 AND MASS SPECTRO?  
L14 16 S L13 NOT PY>1994  
L15 820 S (VACUUM OR REDUC? (2A) PRESSURE) AND (SAMPLE OR SUPPORT OR TRAY OR PLATE) (7A) (POSITION? OR EXCHANG? OR TRANSPORT? OR MANIPULAT?)  
L16 62 S L15 AND MASS SPECTRO?  
L17 11 S L15 AND (X (3A) Y OR XY)  
L18 55 S L16-17 NOT PY>1994  
L19 6 S L16-17 NOT L18 AND PATENT/DT  
L20 3 S L19 AND (1992 OR 1995 OR 1996) /PY  
L21 174 S L6, L8, L11, L14, L18, L20  
L22 169 S L21 NOT (ION SPRAY OR IONSPRAY OR ELECTROSPRAY OR FLUE OR MKH)  
L23 130 S L22 NOT (LANTHANON OR CHROMATOG? OR CAPILLARY OR PROCESS GAS)  
L24 39 S L22 NOT L23  
L25 3 S L24 AND (ALL GLASS OR AUTOMATED OR SAMPLE SUPPLY) /TI  
L26 126 S L23 NOT (AERATION OR PULSED VALVE OR MEMBRANE INLET)

=> d 125 1-3 bib,ab

L3 ANSWER 1 OF 3 CA COPYRIGHT 2001 ACS  
AN 96:93600 CA  
TI Automated transportable mass spectrometer  
AU Echo, M. W.  
CS Exxon Nucl. Idaho Co., Inc., Idaho Falls, ID, USA  
SO Report (1981), ENICO-1096; Order No. DE82000903, 45 pp. Avail.: NTIS From: Energy Res. Abstr. 1981, 6(23), Abstr. No. 34403  
AB The need was identified for a mass spectrometer (MS) which can be conveniently transported among several facilities for rapid verification of the isotopic compn. of special nuclear material. This requirement for a lightwt., transportable MS for U and Pu mass anal. was met by deleting the gas chromatograph (GC) portions of a Hewlett-Packard (H-P) Model 5992 Quadrupole GCMS and substituting a vacuum lock sample entry system. A programmable power supply and vacuum gage were added and circuitry modifications were made to enable use of the supplied software. The accuracy is better than 1% for isotope ratios <20 and better than 2% for ratios of 100.

L5 ANSWER 2 OF 3 CA COPYRIGHT 2001 ACS  
AN 94:23899 CA  
TI Sample supply device  
IN Brodasky, Thomas F.  
PA Upjohn Co., USA  
SO U.S., 7 pp.

PI US 4213326 A 19800722 US 1979-12067 19790214  
AB A vaporized sample is introduced to the ion source of a mass spectrometer of a combined gas chromatog.-mass spectrog. app. by using a device which replaces the jet separator. The sample-introduction device includes a sample-holding tube which is releasably attachable to the isolation valve between the gas chromatog. column and the mass spectrometer. There are means for connecting the sample-holding tube to a vacuum source by means of a valve so that the sample-holding tube can be evacuated prior to connecting it through the isolation valve to the ion source of the mass spectrometer. The device is suitable for use with sample that could not effectively be analyzed by feeding them to the inlet of the gas chromatog. column because of their insufficient volatility.

L25 ANSWER 3 OF 3 CA COPYRIGHT 2001 ACS

AN 69:23028 CA

TI Mass spectrometer all-glass heated inlet

AU Stafford, C.; Morgan, T. D.; Brunfeldt, R. J.

CS Phillips Petrol. Co., Bartlesville, Okla., USA

SO Int. J. Mass Spectrom. Ion Phys. (1968), 1(1), 87-92

AB The design, construction, and operation of an all-glass heated inlet system is described. Used in conjunction with a CEC 21-110 high-resoln. mass spectrometer, the temp. range is extended to 450°. The system permits rapid introduction through a sample lock (without loss of vacuum in the spectrometer source) of small amts. (0.1 mg.) of either liq. or solid samples. Samples with  $\geq 10 \mu$  vapor pressure at 450° can be analyzed. High-boiling impurities can be identified by manual temp. programming. Mass spectra of vapors evolved from S-based paint, gas chromatog. samples, and lubricating oils of mol. wts.  $\geq 800$  can be obtained.

=> d 126 bib,ab 1-126

L26 ANSWER 1 OF 126 CA COPYRIGHT 2001 ACS

AN 126:150258 CA

TI Laser desorption ionization mass monitor (LDIM)

IN Weinberger, Scot R.; Egan, Robert W.; Hoppedeceased, Thomas W.; Gassmann, Ernst; Schar, Martin M.; Bornsen, Klaus O.; Tarantino, E. Rocco

PA Hewlett Packard Company, USA

SO U.S., 32 pp. Cont.-in-part of U.S. 5, 382, 793.

PI US 5594243 A 19970114 US 1993-27317 19930304

US 5382793 A 19950117 US 1992-847450 19920306 <-

PRAI US 1992-847450 19920306

AB A laser desorption ionization instrument for measuring the mol. wt. of large org. mols. includes a time of flight (TOF) mass spectrometer. The time of flight mass spectrometer includes a sample lock for holding, under vacuum, a plurality of samples to be analyzed. A sample may be inserted into and removed from the sample lock and into the mass spectrometer without breaking vacuum in the spectrometer. Signal processing electronics of the LDIM instrument include means for identifying quasi-mol. species of a mol. being measured. The instrument includes improvements in ion optics, microchannel plate detectors, laser irradn. of samples, and prepns. of samples for measurement.

L26 ANSWER 10 OF 126 CA COPYRIGHT 2001 ACS

AN 122:17671 CA

TI A commercial gas analyzer adapted for thermal desorption studies

AU Cabrera, A.L.; Morales, Erie; Altamirano, Luis; Espinoza, Patricio

CS Facultad de Fisica, Pontificia Universidad Catolica de Chile, Santiago, Chile

SO Rev. Mex. Fis. (1993), 39(6), 932-8  
AB A system for thermal desorption studies can be implemented very straightforwardly from a com. instrument designed for gas analyses. The com. instrument incorporates a quadrupole mass spectrometer and the vacuum station to operate the spectrometer. The instrument is modified with a stainless steel six-way cross device which accommodates a sample manipulator, a leak valve and an Ar sputtering gun. The sample foil is resistively heated with very linear rates using a custom made power supply. Descriptions of the custom made sample manipulator and power supply are given. Results of hydrogen and carbon monoxide desorption from palladium foil are discussed.

L26 ANSWER 11 OF 126 CA COPYRIGHT 2001 ACS

AN 121:123213 CA

TI Process of shaping features of semiconductor devices

IN Swanson, Lynwood W.; Lindquist, John M.

PA Fei Co., USA

SO PCT Int. Appl., 22 pp.

PI WO 9413010 A1 19940609 WO 1992-US10151 19921125

AB Semiconductor devices are modified and/or repaired by a gas enhanced phys. sputtering process. A sample is positioned on a movable X-Y stage located within a lower chamber which is evacuated and under the control of vacuum controller. In an evacuated envelope a focused ion beam passes from a liq. metal ion source through column and deflection means and is scanned over an area to be removed on the sample. I vapor from a source is directed toward the same area to aid in the selective sputtering by enabling a chem. reaction at the scanned area. The I may be initially handled in a solid state and is then heated inside the focused ion beam system without presenting a toxic hazard.

L26 ANSWER 13 OF 126 CA COPYRIGHT 2001 ACS

AN 121:61947 CA

TI 14C and 90Sr measurements at the Erlangen AMS facility

AU Arslan, F.; Behrendt, M.; Ernst, W.; Finckh, E.; Greb, G.; Gumbmann, F.; Haller, M.; Hofmann, S.; Karschnick, R.; et al.

CS Physikalisches Institut, Universitaet Erlangen-Nuernberg, Erlangen, D-91058, Germany

SO Nucl. Instrum. Methods Phys. Res., Sect. B (1994), 92(1-4), 39-42

AB The AMS beamline at the Erlangen EN tandem accelerator has been completed and improved. The high-current Cs sputter ion source has been finished and is being used mainly with carbon and SrF<sub>2</sub> samples. Sample exchange is done by remote control, under high voltage and without breaking the vacuum. Fast isotope switching is performed by applying high voltage pulses of adjustable length at the chamber of the 90° injection magnet, which can be used for different kinds of ions and beam currents. Using a new 120° magnetic split-pole spectrograph, 90Sr was measured at isotopic ratios 90Sr/88Sr between 10<sup>-9</sup> and 10<sup>-8</sup> for environmental applications.

Radiocarbon dating of samples along the cross section of tropical trees yielded information about the growth rhythms of the tropical wood, which are difficult to det. because of missing tree ring patterns.

L26 ANSWER 14 OF 126 CA COPYRIGHT 2001 ACS

AN 120:310844 CA

TI Inert gas purgebox for Fourier transform ion cyclotron resonance mass spectrometry of air-sensitive solids

AU May, Michael A.; Marshall, Alan G.

CS Dep. Chem., Ohio State Univ., Columbus, OH, 43210, USA

SO Rev. Sci. Instrum. (1994), 65(3), 612-16

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Q

AB A sealed rigid "purgebox" makes it possible to load air- and/or moisture-sensitive solids into the solids probe inlet of a Fourier transform ion cyclotron resonance (FT/ICR) mass spectrometer. A pelletized sample is transferred (in a sealed canister) from a com. drybox to a Lucite purgebox. After the box is purged with inert gas, an attached glove manipulator is used to transfer the sample from the canister to the solids probe of the mass spectrometer. Once sealed inside the inlet, the sample is pre-evacuated and then passed into the high vacuum region of the instrument at ~10<sup>-7</sup> Torr. The purgebox is transparent, portable, and readily assembled/disassembled. Laser desorption FT/ICR mass spectra of the air- and moisture-sensitive solids, NbCl<sub>5</sub>, NbCl<sub>2</sub>(C<sub>35</sub>H<sub>5</sub>)<sub>2</sub>, and Zr(CH<sub>3</sub>)<sub>2</sub>(C<sub>5</sub>H<sub>5</sub>)<sub>2</sub> are obtained without significant oxidn. The residual water vapor concn. inside the purgebox was measured as 100±20 ppm after a 90-min purge with dry nitrogen gas. High-resoln. laser desorption/ionization mass spectrometry of air-sensitive solids becomes feasible with the present purgebox interface. With minor modification of the purgebox geometry, the present method could be adapted to any mass spectrometer equipped with a solid sample inlet.

L26 ANSWER 15 OF 126 CA COPYRIGHT 2001 ACS

AN 120:207638 CA

TI Multisample probe for fast-atom bombardment/mass spectrometry

AU Siegel, Marshall M.; Tsao, Rushung; Bouley, William; Kornas, Theodore; Brubaker, Glen

CS Med. Div., Am. Cyan. Co., Pearl River, NY, USA

SO J. Am. Soc. Mass Spectrom. (1993), 4(6), 504-6

AB An inexpensive multisample fast-atom bombardment (FAB) probe assembly was designed for high-throughput anal. of samples on a VG ZAB-SE mass spectrometer. The system consists of a vacuum lock system and a FAB probe whose tip contains five or more sample wells. The probe enters the mass spectrometer source region perpendicular to the secondary ion beam axis. The probe is maintained at high voltage on contact with a spring clip attached to the screen plate of the source block. Sample throughput with the multisample probe is twice that of a coaxial probe, with about twice the sensitivity and no sample cross contamination.

L26 ANSWER 18 OF 126 CA COPYRIGHT 2001 ACS

AN 119:194545 CA

TI The IsoTrace/HVEE high capacity ion source for AMS

AU Kieser, W. E.; Kilius, L. R.; Rucklidge, J. C.; Beukens, R. P.; Litherland, A. E.; Koudijs, R.

CS IsoTrace Lab., Univ. Toronto, Toronto, ON, M5S 1A7, Can.

SO Nucl. Instrum. Methods Phys. Res., Sect. B (1993), B79(1-4), 613-16

AB A new ion source and sample manipulation system for accelerator mass spectrometry has been designed at IsoTrace and a prototype has been built by High Voltage Engineering Europa B.V. The design incorporates remote Cs+ primary beam generation and rapid interchange between samples, both used successfully in an earlier system. This new design includes dual Cs primary beams, improved primary and secondary beam optics, more open vacuum system design with provision for high capacity pumping, sample viewing optics, and up to 72 target capacity.

L26 ANSWER 20 OF 126 CA COPYRIGHT 2001 ACS

AN 118:242874 CA

TI A modified high-intensity cesium sputter negative-ion source with multi-target mechanism

AU Si, Houzhi; Zhang, Weizhong; Zhu, Jinhau; Du, Guangtian; Zhang, Tiaorong; Gao, Xiang

CS Shanghai Inst. Nucl. Res., Shanghai, 201800, Peop. Rep. China  
SO Nucl. Instrum. Methods Phys. Res., Sect. A (1993), A328(1-2), 207-10  
AB The source is based on R. Middleton's (1983) high-intensity mode, but modified to a multitarget version. It is equipped with a spherical Mo ionizer, a 20-position target wheel and a vacuum lock for loading and unloading sample batches. A metal-ceramic bonded section protected by a specially designed labyrinth shielding system results in reliable insulation of the cathode and convenient control of Cs vapor. The latter is particularly important when an oversupply of Cs occurs. The source was developed for accelerator mass spectrometry (AMS) applications. Recently, 3 versions based on the prototype of the source have been successfully tested to meet different requirements: (1) single target version, (2) multitarget version with manual sample change, and (3) multitarget version with remote control sample change. Some details of the tech. and operational characteristics are presented.

L26 ANSWER 21 OF 126 CA COPYRIGHT 2001 ACS

AN 117:258908 CA

TI Quick sample exchange manipulator for dual molecular beam and scanning tunneling microscopy experiments

AU Sullivan, Daniel J. D.; Kummel, Andrew C.

CS Dep. Chem., Univ. California, San Diego, La Jolla, CA, 92093, USA

SO Rev. Sci. Instrum. (1992), 63(10, Pt. 1), 4285-8

AB The design, construction, and operation of an ultrahigh-vacuum manipulator for combined mol. beam and scanning tunneling microscopy expts. is described. The manipulator allows (1) sample transfer, (2) liq.-nitrogen cooling, (3) electron beam heating, (4) rotation about the vertical and horizontal axes, and (5) elec. isolation of the sample. The unique features of the design are direct transfer of a 3/8-in.-diam. sample to a load-lock sample carrier without the use of a second transfer arm and sample mounting and electron beam heating systems that permit the sample to be several hundred degrees hotter than the sample mounting plate, thus minimizing sample contamination.

L26 ANSWER 22 OF 126 CA COPYRIGHT 2001 ACS

AN 116:202623 CA

TI A new design of a cesium sputter ion source for accelerator mass spectrometry

AU Niklaus, Th. R.; Baur, W.; Bonani, G.; Synal, H. A.; Woelfli, W.

CS Inst. Intermed. Energy Phys., ETH-Hoenggerberg, Zurich, CH-8093, Switz.

SO Rev. Sci. Instrum. (1992), 63(4, Pt. 2), 2485-7

AB Accelerator mass spectrometry (AMS) requires ion sources delivering intense neg. ion beams of high stability. In addn., a multitarget system and a vacuum lock for sample loading are essential for efficient operation. We present a new design of a Cs neg. ion sputter source with the following features: the vacuum chamber of the ion source and the target cassette are at ground potential. Batches of targets can be loaded and unloaded without interrupting the operation of the source. All control systems for sample loading and automatic changing are also at ground potential. This ion source concept has already been successfully applied to AMS. The new design incorporates a spherical Cs surface ionizer to increase the neg. ion currents. Difficulties in realizing this concept are the high elec. fields inside the vacuum chamber in an environment with high Cs vapor pressure. Also crit. are the proper and reliable operation of all mech. components under these conditions and the large temp. gradients.

L26 ANSWER 33 OF 126 CA COPYRIGHT 2001 ACS

AN 111:186365 CA

TI SIMS-AES analytical system for on-line technological applications  
AU Cherepin, V. T; Chenakin, S. P.; Dubinskii, I. N.  
CS Inst. Met. Phys., Kiev, 252142, USSR  
SO Second. Ion Mass Spectrom., Proc. Int. Conf., 6th (1988), Meeting Date 1987, 197-200. Editor(s): Benninghoven, Alfred; Huber, Alfred M.; Werner, H. W. Publisher: Wiley, Chichester, UK.  
AB The design and anal. characteristics are described of a versatile compact anal. assembly for SIMS-Auger electron spectroscopy surface study of samples. The assembly may be operated sep. or be connected to a technol. chamber positioned at a distance  $\leq$  2.5 m. Interconnection between the two stations is carried out using a sample transportation system without vacuum breaking in both chambers.

L26 ANSWER 34 OF 126 CA COPYRIGHT 2001 ACS

AN 111:160978 CA

TI Ultrahigh-vacuum apparatus for surface spectroscopy and characterization at cryogenic temperatures

AU Chia, Victor K. F.; Veirs, D. Kirk; Rosenblatt, Gerd M.

CS Mater. Chem. Sci. Div., Lawrence Berkeley Lab., Berkeley, CA, 94720, USA

SO Rev. Sci. Instrum. (1989), 60(6), 1161-6

AB An ultrahigh-vacuum app. is described that enables the study of mol. adsorbates on well-defined single crystals at controlled temps. from 14 to 900 K. Sample cooling is achieved with a closed-cycle He refrigerator coupled to the sample holder via a flexible Cu cable. This configuration maintains a 3-K temp. differential from the 11-K cryocold head to the sample and damps vibrations from the cyrocold head. The cryogenic sample manipulator allows X, Y, Z translations, tilt, and rotation of an arom holding the sample through an arc of 270° about the vertical central axis of the vacuum chamber. The sample, mounted 12.7 cm from the central axis, may also be rotated 90° about a vertical axis through the sample. Rotation of the sample about a working circle radius of 12.7 cm allows the sample to be accessed for surface cleaning, characterization, and study by instrumentation whose phys. size does not allow access by sample rotation about the chamber central axis alone. Unenhanced surface Raman spectroscopy, LEED, and Auger spectroscopy can be carried out while maintaining a controlled sample temp. Laser entry ports at 2 incident angles permit the study of substrates with differing optical properties. Unenhanced surface Raman spectra of N physisorbed on Ag(111) surface are presented.

L26 ANSWER 36 OF 126 CA COPYRIGHT 2001 ACS

AN 110:201179 CA

TI Time-of-flight mass spectrometer for investigating hydrogen isotope interactions; hydrogen/deuterium exchange rates at stainless steel and silicon surfaces

AU Gill, J. T.; Watkins, D. B.; Rigano, J. N.; Clift, W. A.; Watkins, R. A.; Burwinkle, A. L.; Schultz, J. A.; Anderson, L. R.; Schmidt, H. K.

CS Monsanto Res. Corp., Miamisburg, OH, 45342, USA

SO Fusion Technol. (1988), 14(2, Pt. 2B), 1026-35

AB Time-of-flight Secondary Ion Mass Spectrometry/Direct Recoil (TOF SIMS/DR) techniques and app. are described which hold substantial promise for further understanding the behavior of H isotopes at surfaces. The anal. app. will be interfaced to a T-compatible exposure cell within a glovebox by means of a vacuum load-lock. App. will consist of a pulsed Li+ beam for H/D/T ratios (DR), a d.c. or pulsed Cs+ beam for sputtering or TOF/SIMS (for enhancement of neg. ion yields), and a dual channel 10 MHz time-digitizing histogrammer for fast data rates. Prototype app. has already proven useful in understanding the rates at which H isotopes may be exchanged from material surfaces upon exposure to water vapor. An

extremely fast and a 2nd much slower process characterize the exchange at Si and stainless steel oxyhydroxide surface films. The fast process is limited by the rate at which water mols. strike the top monolayer of the surface. H/D exchange tunneling appears to be involved. The slow process appears to be the bulk diffusion-limited exchange rate within the oxyhydroxide film. Diffusion consts. were derived: Dex 10-19 and 10-20 cm<sup>2</sup>/s for the films on 304 stainless steel (SS) and Si, resp., at 298K and 1.3 x 10-4 Pa (10-6 torr) [H<sub>2</sub>O]. Dex For 304SS is consistent with previous results on  $\alpha$ -FeOOH and SS. Diffusion exchange appears important in understanding the behavior of T permeation or contamination barriers.

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ANSWER 37 OF 126 CA COPYRIGHT 2001 ACS

AN

110:199733 CA

TI

SIMS depth profiling of an insulating, air-sensitive material

AU

Cristy, S. S.

CS

Martin Marietta Energy, Syst., Inc., Oak Ridge, TN, 37831, USA

SO

Second. Ion Mass Spectrom., Proc. Int. Conf., 6th (1988), Meeting Date 1987, 529-32. Editor(s): Benninghoven, Alfred; Huber, Alfred M.; Werner, H. W. Publisher: Wiley, Chichester, UK.

AB

Depth profiles can be obtained for LiH samples exposed to moisture by coating cleaved surfaces with 100-200 nm Au films (for charge compensation) and carefully mounting samples in In (an elec. conducting medium). Samples were maintained in a dry box attached to a high vacuum gate valve and were transferred under vacuum to the ion microprobe mass analyzer. The inevitable slight exposure to H<sub>2</sub>O caused formation of a LiOH layer. Ion implanted B (35, 180 keV) or O (180 keV) gave well-shaped, reproducible peaks for Au coatings  $\geq$ 100 nm. The reaction mechanism of LiH with H<sub>2</sub>O is LiH + H<sub>2</sub>O  $\Rightarrow$  LiOH + H<sub>2</sub> with subsequent reaction LiH + LiOH  $\Rightarrow$  Li<sub>2</sub>O + H<sub>2</sub> at the LiH/LiOH interface as confirmed by depth profile data for D, Li, and O which show formation of a Li<sub>2</sub>O layer between LiOD and LiH.

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ANSWER 40 OF 126 CA COPYRIGHT 2001 ACS

AN

107:194545 CA

TI

An apparatus and method for mass analysis of a chemical sample

PA

Spectros Ltd., UK

SO

Jpn. Kokai Tokkyo Koho, 9 pp.

PI

JP 62085851 A2 19870420 JP 1986-192984 19860820  
US 4820648 A 19890411 US 1985-767820 19850821

PRAI

US 1985-767819 19850821

AB

A mass spectrometer is described comprising of a high- vacuum system, a target carrier having a surface for supporting a sample positioned in the vacuum system, a means of ionizing the sample on the target carrier, and a means of mass analyzing the ions. Addnl., the spectrometer is provided with means of continuously introducing the sample into the vacuum system and placing the sample on the target carrier regardless of temporal changes in the sample compn. A method for carrying out the mass anal. involves continuous introduction of the sample into the vacuum system.

Alternatively, the method involves continuous anal. of a biopolymer sample by the following steps: (1) carrying out the reaction between the biopolymer and a material (which sequentially sep. the terminal unit of the biopolymer) to continuously place the reaction products on the target of a sputtering ion source and to ionize the reaction products for mass-spectral mol; and (2) identifying the terminal units by temporal decrease in the mol. wt. of the biopolymer. A sample mixt. contg. polypeptide H-Arg-Pro-Pys-Pro-Glu-Glu-Phe-Phe-Gly-Leu-Met-OH and carbodipeptidase Y and B was continuously introduced into the app. to det. the polypeptide sequence.

L26

ANSWER 43 OF 126 CA COPYRIGHT 2001 ACS

AN 106:25507 CA  
TI Automatic sample loader for LKB model 9000 mass spectrometer  
AU Kath, Gary S.; McKeel, Walter J.; Smith, Jack L.; Liesch, Jerryold M.  
CS Merck Sharp and Dohme Res. Lab., Merck Inst. Therap. Res., Rahway, NJ,  
07065, USA  
SO Rev. Sci. Instrum. (1986), 57(12), 3114-19  
AB An automatic sample loading system is designed for use with the LKB model 9000 mass spectrometer. The app. permits solid samples previously placed in glass vials to be automatically entered one by one into the jet separator of the mass spectrometer for anal. An 8085 based microcomputer controls the movement of the sample into the vacuum, positions the sample in a heating zone for vaporization, initiates a no. of mass scan measurements, dumps the sample when complete, and prompts the data system for the next sample. The app. can analyze up to 50 samples with no operator intervention.

L26 ANSWER 45 OF 126 CA COPYRIGHT 2001 ACS  
AN 105:16423 CA  
TI Mass spectrometer controlled electron beam evaporation synthesis of multilayered materials  
AU Sevenhans, W.; Locquet, J. P.; Bruynseraeede, Y.  
CS Lab. Vaste Stof-Fys. Magn., Kathol. Univ. Leuven, Louvain, B-3030, Belg.  
SO Rev. Sci. Instrum. (1986), 57(5), 937-40  
AB An ultrahigh vacuum app. equipped with 2 high-power electron guns was extended with a multichannel quadrupole mass spectrometer which accurately controls the deposition rate. A rotating substrate holder was used for deposition of multilayers at room temp.; a fixed substrate holder enables one to prep. layered structures at liq. N temp. A home-built load lock in combination with an extended travel sample manipulator permits a rapid change of the samples without breaking vacuum. The system was used to deposit Nb/Cu and Pb/Ge multilayers and preliminary structural measurements indicate the samples are of high quality.

L26 ANSWER 46 OF 126 CA COPYRIGHT 2001 ACS  
AN 105:8394 CA  
TI Three-axis sample manipulator with XYZ translation for use in UHV  
AU Engel, Thomas; Braid, Donald; Conrad, Edward H.  
CS Dep. Chem., Univ. Washington, Seattle, WA, 98195, USA  
SO Rev. Sci. Instrum. (1986), 57(3), 487-9  
AB A 3-axis manipulator suitable for atom diffraction expts. was constructed by combining 3 modules with translation, polar rotation, and azimuthal-tilt rotation capabilities. No magnetic materials are used and materials were chosen to minimize the possibility of galling in vacuum. Azimuthal rotations of up to  $\pm 110^\circ$ , tilt rotations of up to  $\pm 30^\circ$ , and polar rotations of  $\pm 180^\circ$  are possible. The Z motion is  $\pm 2$  in. and XY motions of 10 mm lead to a change of the azimuthal and tilt angles of  $<1^\circ$ . The sample is heated by electron bombardment and can be cooled to 80 K.

L26 ANSWER 48 OF 126 CA COPYRIGHT 2001 ACS  
AN 102:16621 CA  
TI Apparatus for mass spectrometric analysis of surface contamination  
AU Faerman, V. I.; Agafonov, I. L.; Potapov, A. M.  
CS USSR  
SO Fiz.-Khim. Metody Anal. (1983) 93-4  
AB The app., based on the MSKh-5 time-of-flight mass spectrometer, has a Nd-glass pulsed laser for photodesorption of chemisorbed surface contaminants, a vacuum valve for sample introduction, and a video magnetic recorder for rapid spectrum acquisition. The anal. time is 1-2 min.

L26 ANSWER 50 OF 126 CA COPYRIGHT 2001 ACS

AN 101:198694 CA

TI Wide temperature range sample manipulator for surface studies in ultrahigh vacuum

AU Stroscio, Joseph A.; Ho, W.

CS Lab. At. Solid State Phys., Cornell Univ., Ithaca, NY, 14853, USA

SQ Rev. Sci. Instrum. (1984), 55(10), 1672-4

AB A sample manipulator for ultrahigh-vacuum surface studies is described. The manipulator possesses long vertical (z) translation, decoupled rotary motion, x-y-z, and tilt stages. The design incorporates a simple and compact sample holder which allows the capabilities of liq.-N<sub>2</sub> or He cooling, and high-temp. resistive heating with rapid temp. cycling.

L26 ANSWER 53 OF 126 CA COPYRIGHT 2001 ACS

AN 100:77091 CA

TI Fabrication of V-type filaments for surface ionization mass spectrometry

AU Stoffels, J. J.; Lagergren, C. R.

CS Pac. Northwest Lab., Richland, WA, 99352, USA

SO Int. J. Mass Spectrom. Ion Processes (1984), 55(2), 217-19

AB The fabrication of V-type filaments for surface ionization mass spectrometry was accomplished with a special fixture which forms the filament and holds it in position for spot-welding to the support posts of the filament block. The entire fabrication procedure takes ~30 s. The filament block is of special design for use with a ceramic vacuum lock for rapid sample changing without breaking vacuum. The fixture design is readily modified to accommodate different styles of filament assemblies.

L26 ANSWER 56 OF 126 CA COPYRIGHT 2001 ACS

AN 99:45913 CA

TI Direct sample input apparatus for mass spectrometer

PA Hitachi, Ltd., Japan

SO Jpn. Tokkyo Koho, 4 pp.

PI JP 58003589 B4 19830121 JP 1977-34496 19770330

AB The design is claimed of a direct sample input app. for a mass spectrometer provided with a direct sample input valve installed in such a way as to connect the ion source section to the sample inlet section via a tiny orifice where opening and closing rate can be adjusted.

L26 ANSWER 60 OF 126 CA COPYRIGHT 2001 ACS

AN 96:188882 CA

TI Improvements in the application of a tandem Van de Graaff accelerator for ultrasensitive mass spectrometry

AU Suter, M.; Balzer, R.; Bonani, G.; Stoller, C.; Woelfli, W.; Beer, J.;

Oeschger, H.; Stauffer, B.

CS Lab. Kernphys., ETH, Zurich, 8093, Switz.

SO Argonne Natl. Lab., Phys. Div., [Rep.] ANL/PHY (1981), ANL/PHY-81-1, Symp. Accel. Mass. Spectrom., 87-99

AB For high precision mass spectrometry (e.g. for <sup>14</sup>C) the EN-Tandem facility existing at the ETH was modified by applying a concept similar to that used for the dedicated facilities. First an isotope analyzer system consisting of an electrostatic deflector, a magnetic spectrometer and a ΔE-E counter was set up on a sep. beam line at the high energy end of the accelerator. Then after testing, a new ion source arrangement was installed, including a vacuum lock for sample loading and a new high resoln. 90°-inflection magnet. For measuring isotopic ratios accurately, a fast cycling system is now under development. Furthermore, an electronic control system was designed which allows one to tune the ion beam in a reproducible way and

L26 continuously monitor it during operation.

ANSWER 61 OF 126 CA COPYRIGHT 2001 ACS

AN 95:152625 CA

TI Apparatus for automatic loading of mass spectrometers with samples

IN Brunnee, Curt; Delgmann, Lothar; Martens, Guenter

PA Varian MAT G.m.b.H., Fed. Rep. Ger.

SO Ger. Offen., 25 pp.

PI DE 3002575 A1 19810730 DE 1980-3002575 19800125

AB The attachment for transferring a sample holder into the vacuum chamber of a mass spectrometer or similar instrument has an axially movable, motor-driven rod that takes up a sample holder on one of its ends, an intermittently rotated disk that holds the sample holders and has a cutout for passage of the rod, and a lock with a no. of seals and a vacuum valve through which the transfer rod passes to place the sample holder inside the vacuum chamber.

L26 ANSWER 63 OF 126 CA COPYRIGHT 2001 ACS

AN 95:139167 CA

TI Ultrahigh vacuum multipurpose offset manipulator for surface and thin film reaction studies

AU Crider, C. A.

CS Plasma Phys. Lab., Princeton Univ., Princeton, NJ, 08544, USA

SO Rev. Sci. Instrum. (1981), 52(8), 1156-60

AB A novel ultrahigh vacuum (UHV) manipulator was constructed which allows positioning of a sample on any point of an 11.5-cm radius main circle and provides two orthogonal off-axis rotations at the selected point. The motions are a 0°-90° tilt of the sample face and a ±180° rotation normal to the sample face. The main circle position may be varied by ±1 cm in X and Y directions and ±0.7 cm in the Z direction, which is orthogonal to the plane of the main circle. Addnl., at any position the sample is elec. isolated, fitted with a thermocouple, and may be heated resistively to 1200°. The manipulator is UHV compatible and may be baked to 200°.

L26 ANSWER 66 OF 126 CA COPYRIGHT 2001 ACS

AN 94:20894 CA

TI Angle-resolved photoelectron spectrometer for the use of surface study of solids

AU Suzuki, Shoji; Furusawa, Kenji; Terasawa, Masaaki; Yoshida, Midori; Sagawa, Takasi

CS Fac. Sci., Tohoku Univ., Sendai, 980, Japan

SO Sci. Rep. Tohoku Univ., Ser. 8 (1980), 1(1), 16-29

AB An angle-resolved photoelectron spectrometer constructed recently is described. It consists of an electron energy analyzer movable in situ from the outside of an ultra-high-vacuum (UHV) chamber, an UV light source and a sample manipulator. An ion-pump system is used to evacuate the chamber to <10-10 Torr. Several auxiliary apps., such as LEED, RHEED and/or RMED. Ar+ ion-bombardment and/or sample cleaving systems, a mass spectrometer, and a gas inlet system are installed in the chamber.

L26 ANSWER 69 OF 126 CA COPYRIGHT 2001 ACS

AN 91:64763 CA

TI Employment of a completely automated mass spectrometer in fissile material control

AU Wilhelm, M.; Brandalise, B.; Koch, L.; Rijkeboer, C.; Romkowski, C.

CS Kernforschungszent. Karlsruhe, Karlsruhe, Fed. Rep. Ger.

SO Report (1977), KFK-2319, EUR-5504, 107 pp. Avail.: NTIS From: Energy Res. Abstr. 1979, 4(4), Abstr. No. 7521

AB The demand for higher accuracy and a shorter delay in the anal. together with better data security needed in safeguards, lead to the automation of a mass spectrometer. Starting with the continuous feed of samples via a high vacuum lock and including the subsequent heating, focussing and scanning of the samples as well as the final evaluation of the data (taking  $\alpha$ -spectrometry and the wts. required for the isotropic diln. technique into account), the mass spectrometric procedure was completely automated. A serial CH-5 instrument of VARIAN MAT was modified to be operated by a VARIAN 620/I computer. A newly developed 3-chamber high vacuum lock was attached to this system and the final evaluation was made with an IBM 370. The system has been used in operation for the isotope anal. of U, Pu and Nd for 1 yr. Major breakdowns of the hardware did not occur, however, the computer programs had to be steadily improved according to the changing characteristics of the samples. Compared to manual operation, the automated technique is superior.

L26 ANSWER 71 OF 126 CA COPYRIGHT 2001 ACS

AN 90:130798 CA

TI An uhv system for in situ preparation and analysis of thin films and surfaces

AU Shapira, Y.; Gruenbaum, E.

CS Sch. Eng., Tel-Aviv Univ., Tel Aviv, Israel

SO Vacuum (1978), 28(12), 523-6

AB A versatile uhv (ultrahigh vacuum) system was designed to enable the prepn. of thin films of different materials and their anal. to be undertaken. It includes various sources for evapn.: a high-power electron gun, conventional crucibles, and Knudsen cells. An airlock is available for fast transfer of prepnd. films and new substrates. By a special sample holder the thin films can be manipulated to different positions for structural anal. by reflection high energy electron diffraction, and for chem. anal. by Auger electron spectroscopy, and secondary ion mass spectrometry.

L26 ANSWER 74 OF 126 CA COPYRIGHT 2001 ACS

AN 88:108438 CA

TI Procedure for local determination of the isotopic composition of lithium in meteorites

AU Kaviladze, M. Sh.; Melashvili, T. A.; Sepiashvili, L. D.

CS Tbilis. Gos. Univ., Tiflis, USSR

SO Meteoritika (1977), 36, 66-70

AB A modified mass spectrometer was used to det. the  $7\text{Li}/6\text{Li}$  ratios at various points on the surface and within meteorites. This ratio was found uniformly const. in the 6 meteorites studied. The app. consists of vacuum chamber housing a sample holder-manipulator, a focused laser beam, and a mass spectrometer. The impact of the laser beam evaps. a small amt. of the sample from a preselected point and the vapor is analyzed for Li isotopes. The samples can be changed and manipulated without breaking the vacuum. The highest concns. of Li were contained in grains of olivine of common chondritic meteorites. For the enstatite chondrites the troilite grains contained the high Li concs.

L26 ANSWER 75 OF 126 CA COPYRIGHT 2001 ACS

AN 88:98109 CA

TI A new UHV-specimen preparation chamber for solid surface analysis with sample transport mechanism over a UHV-sluice lock to a SIMS-apparatus

AU Klaus, N.; Higatsberger, M. J.

CS I. Phys. Inst., Univ. Wien, Vienna, Austria

SO Proc. Int. Vac. Congr., 7th (1977), Volume 3, 2597-600. Editor(s):

Dobrozemsky, R.; Ruedenauer, F.; Viehboeck, F. P. Publisher: R.  
Dobrozemsky, Vienna, Austria.

AB Construction and operation of a new ultrahigh-vacuum specimen prepн. chamber capable of heat-treatment up to 400° together with a sample transport mechanism from the prepн. chamber to a secondary-ion mass spectrometry (SIMS) app. over an ultrahigh-vacuum lock are described. Solid samples of ~1 cm<sup>2</sup> can be treated in the ultrahigh-vacuum prepн. chamber. Surface layers over the whole sample area must be removed by ion bombardment at a rate of 1 layer/s. It is also possible to deposit layers of solid substances including high-melting materials by evapn. processes. The thickness of removed or evapd. layers can be continuously measured. Provisions are made to cool the samples to liq.-N temp. as well as to heat to melting temp. by electron bombardment. In the prepн. chamber as well as in the SIMS analyzing chamber, target temps. can be monitored. Tech. details are given for the transport and the coupling mechanism of the specimen between the 2 ultrahigh-vacuum chambers. 1St results with this new anal. surface instrument will be reported.

L26 ANSWER 80 OF 126 CA COPYRIGHT 2001 ACS

AN 83:107884 CA

TI Apparatus and method for evaluating the gas content of materials

IN Attia, Edward A.

PA Allis-Chalmers Corp.

SO U.S., 8 pp.

PI US 3866041 A 19750211 US 1973-408928 19731023

PRAI US 1973-408928 19731023

AB The detn. of gases in materials used for vacuum interrupters is based on vaporization of a small portion of the sample in a vacuum chamber by a d.c. arc, measuring the total pressure of the evolved gas by an ion gage, and detg. the compn. of the gases by a mass spectrometer attached to the chamber. A carousel which accommodates 2 rows of 4 samples each (including ref. samples) is rotated by 90° turns to align and lock the samples before the arc initiating mechanism, thus permitting samples and stds. to be analyzed under the same conditions for meaningful comparison. To reduce desorption effects from the inner surfaces, the chamber is baked out for 36 hr at 400° and 10<sup>-8</sup> torr. before testing.

L26 ANSWER 81 OF 126 CA COPYRIGHT 2001 ACS

AN 80:88621 CA

TI New mass spectrometer system for investigating laser-induced vaporization phenomena

AU Lincoln, Kenneth A.

CS Ames Res. Cent., NASA, Moffett Field, Calif., USA

SO Int. J. Mass Spectrom. Ion Phys. (1974), 13(1), 45-53

AB A laser combined with a mass spectrometer in configuration developed for studies of high-temp. materials. A vacuum-lock, solid-sample inlet was mounted at 1 end of a cylindrical, high-vacuum chamber 1 m long with a nude ion-source, time-of-flight mass spectrometer at the opposite end. The samples were positioned along the axis of the chamber at distances <1 m from the ion source, and their surfaces were vaporized by a pulsed laser beam entering through windows on a side of the chamber. Laser-induced vaporization of several graphites was studied.

L26 ANSWER 87 OF 126 CA COPYRIGHT 2001 ACS

AN 75:83106 CA

TI Automatic analytical laboratory for mass-spectrometric isotopic-dilution analysis of uranium and plutonium in fuel solutions

AU Wilhelmi, Marlies; Beyrich, W.; Gerin, F.; Romkowski, M.; Tasman, H. A.

CS Eur. Inst. Transurane, Karlsruhe, Ger.  
SO Safeguards Tech., Proc. Symp. (1970), Volume 2, 165-76  
AB An automatic system was planned for mass-spectrometric isotopic-diln. anal. of U and Pu in fuel solns. The individual basic processes, i.e., sampling, spiking, and chem. processing of the samples, mass-spectrometric measurement and calcn. of the anal. data, are automated independently. Experience obtained over 4 yr of manual processing and measurement of several hundreds of samples caused the conversion to automation. The different process steps required for sampling, spiking, and chem. processing of the samples are implemented by components which are combined by a unit-construction system. For the mass-spectrometric measurements com. equipment was automated. The sample throughput of this equipment is to be increased to 48 measurements per 24 hr by a high-vacuum lock system for preheating the samples. Further com. equipment is used to calc. the results of the analyses whose program is being developed. The concept and designing of the facility and the present state of development are reported.

L26 ANSWER 89 OF 126 CA COPYRIGHT 2001 ACS  
AN 74:69303 CA  
TI Ionization of organic solids by laser irradiation  
AU Vastola, Francis J.; Pirone, A. J.  
CS Dep. Fuel Sci., Pennsylvania State Univ., University Park, Pa., USA  
SO Advan. Mass Spectrom. (1968), 4, 107-11  
AB <sup>4</sup> Ion spectra resulting from laser irradn. of several types of org. solids are presented. The output of a ruby laser was focused on the sample by using a Leitz VO 2 x microscope objective lens. The sample was inserted into the mass spectrometer by means of a vacuum lock assembly; the upper surface of the sample was situated just below the path of the electron beam in the ionization chamber. A Bendix model 12-107 time-of-flight mass spectrometer was used to effect rapid anal. during the short period of ion emission from the sample.

L26 ANSWER 90 OF 126 CA COPYRIGHT 2001 ACS  
AN 74:58447 CA  
TI Sorption and ion-getter pumping for a sliding-shaft vacuum lock  
AU Stoffels, J. J.  
CS Pacific Northwest Lab., Battelle Mem. Inst., Richland, Wash., USA  
SO J. Vac. Sci. Technol. (1970), 7(6), 606-7  
AB <sup>5</sup> Single sorption pumps contg. mol. sieve material are connected to the 1st and 2nd pumping stages of a 3-stage alumina sliding-shaft vacuum lock for changing solid samples in surface ionization mass spectrometers for isotope anal. of U; an ion-getter pump with dissimilar cathodes is connected to the 3rd stage. A vacuum-lock end seal extends the period of possible continuous operation between rejuvenations to >1 week.

L26 ANSWER 94 OF 126 CA COPYRIGHT 2001 ACS  
AN 72:48913 CA  
TI Vacuum-lock actuator and ion-source positioner for a surface ionization mass spectrometer  
AU Howard, Olin H.; Langdon, Aubrey; Taylor, Fred W.  
CS Oak Ridge Gas. Diffus. Plant, Oak Ridge, Tenn., USA  
SO U. S. At. Energy Comm. (1969), K-1776, 10 pp. Avail.: Dep.; CFSTI From: Nucl. Sci. Abstr. 1969, 23(20), 41134  
AB A vacuum-lock actuator and an ion-source positioner were designed, fabricated, and installed on a surface-ionization mass spectrometer to eliminate stressing of the analyzer tube, which impairs its alignment. The elec. powered vacuum-lock actuator also eliminates the manual effort

formerly required to operate the vacuum lock.

L26 ANSWER 99 OF 126 CA COPYRIGHT 2001 ACS

AN 68:90977 CA

TI Cartridge-type vacuum lock for a thermal-ionization mass spectrometer.

Rapid determination of relative isotopic ratios of potassium

AU Howard, Olin H.; Langdon, Aubrey; Sulfridge, Clint

CS Oak Ridge Gaseous Diffus. Plant, Union Carbide Corp., Oak Ridge, Tenn., USA

SO Anal. Chem. (1968), 40(3), 643-5

AB A double-filament thermal-ionization source and a carriage-type vacuum lock for a 60°, magnetic, 6-in. radius mass spectrometer are developed and used for the rapid detn. of 41K/39K relative ratios. A K metal sample is hydrolyzed, neutralized with HI, and dried. to give a KI soln. contg. 1 mg. K/ml. A drop of the soln., contg. ~20 µg. K, is placed on the filament of the sample cartridge. The filament is dried by the passage of a 5-amp. a.c., then inserted into the mass spectrometer. The 41K+ and 39K+ ion currents are detected simultaneously on sep. collectors, amplified, and fed to a ratio recorder giving an output proportional to the isotopic ratio. While maintaining a 10-v. 39K signal, a ratio-recorder reading is obtained. The comparative sample is similarly analyzed, followed by a repeat anal. of the 1st sample, and the 41K/39K relative ratio for the 2 samples is calcd. by dividing the higher av. reading by the lower. One 41K/39K relative ratio, requiring 3 sample loadings, is detd. in an hr. and ~0.2% relative standard deviation is observed with relative ratios of ~1-1.5.

L26 ANSWER 101 OF 126 CA COPYRIGHT 2001 ACS

AN 66:16198 CA

TI A new method for introduction of solid samples into a mass spectrometer

AU Vastel, J.; Coulon, Michel

SO Methodes Phys. Anal. (1966), (Jan-March), 48-52

AB A vacuum lock app. is described for the reproducible positioning of either of 2 filaments coated with sample in the surface-ionization source of a mass spectrometer. The filaments can be preheated to a measured temp. outside the source and rapidly exchanged for comparative measurements.

Advantages are claimed in speed and reproducibility over the direct introduction method in detn. of isotope ratios.

L26 ANSWER 102 OF 126 CA COPYRIGHT 2001 ACS

OREF 65:17869g-h

TI Two versions of a sliding bar vacuum lock

AU Boerboom, A. J. H.; de Jongh, A. P.; Kistemaker, J.

CS FOM-Lab. Mass Separation, Amsterdam

SO Rev. Sci. Instr. (1964), 35(3), 301-2

AB Two versions are described of a sliding-bar vacuum lock for the introduction of solid samples into the ion source of a mass spectrometer.

Sealing is obtained by 3-stage differential pumping without the use of gaskets. The first version, having a bar diam. of 25 mm., can be used up to 2 kv. accelerating voltage. The 2nd one, having a 50-mm. diam., is double acting and can be used up to 15 kv.

L26 ANSWER 105 OF 126 CA COPYRIGHT 2001 ACS

OREF 64:6106c

TI Vacuum lock for the direct insertion of samples into a mass spectrometer

AU Junk, Gregor A.; Svec, Harry J.

CS Iowa State Univ., Ames

SO Anal. Chem. (1965), 37(12), 1629-30

AB A direct insertion vacuum lock is described and illustrated. It is small in size and may be fabricated from a com. stainless steel gate valve. It

can be connected to almost any instrument with a min. down time of 1 to 2 days.

L26 ANSWER 108 OF 126 CA COPYRIGHT 2001 ACS

OREF 63:17287c-d

TI Mass spectrometer source loading lock and isolation valve

AU Munro, R.; Ridley, R. G.

CS At. Weapons Res. Estab., Aldermaston, UK

SO Rev. Sci. Instr. (1965), 36(11), 1538-9

AB An all-metal sliding bar vacuum lock is described, using a new type of vacuum seal involving the deflection of the wall of the lock housing. A pressure of  $2 \times 10^{-7}$  torr can be maintained in the main source region of a mass spectrometer during the introduction of solid samples into the source. An isolation valve utilizing a similar principle is also described.

L26 ANSWER 111 OF 126 CA COPYRIGHT 2001 ACS

OREF 62:2349f-g

TI Flash vaporization of solid materials for mass spectrometry by intense thermal radiation

AU Lincoln, K. A.

CS Naval Radiol. Defense Lab., San Francisco, CA

SO (1964), AD 600159, 12 pp. Avail.: OTS From: U.S. Govt. Res. Rept. 39(14), 140(1964).

AB Mass spectra of low vapor pressure materials, such as polymers and metals, were obtained by the technique of flash-vaporization mass spectrometry. Single, thermal pulses from a Xe flashtube vaporize the samples directly into the ion source of a time-of-flight mass spectrometer; the mass spectra appear momentarily on the screen of an oscilloscope and are recorded photographically. This technique, which also renders some short-lived species amenable to mass spectrometric studies, and the app. (including vacuum lock for introducing solid samples into the instrument) are described.

L26 ANSWER 114 OF 126 CA COPYRIGHT 2001 ACS

OREF 58:14007c-f

TI Mass spectrometry. III. Triterpenoids; structure assignment to friedelane derivatives

AU Courtney, J. L.; Shannon, J. S.

CS Univ. New South Wales, Sydney

SO Tetrahedron Letters (1963) 13-20

AB f. Australian J. Chem. 15, 771-85(1962); CA 57, 6739i. Mass spectra were obtained by introduction of the solid sample directly into the ion source, followed by vaporization by heating close to the fringe of the ionizing electron beam. The samples were introduced and withdrawn from a vacuum lock to avoid breaking the vacuum of the analyzer tube. The relationship of friedelanone (I, R = O, R' = H<sub>2</sub>) (II) to friedelane (I, R = R' = H<sub>2</sub>) (III) was established (CA 51, 8125e) and the present studies of II, III and of I (R = O, O, H<sub>2</sub>, H<sub>2</sub>, O, O; R' = O, OH, OH, OAc, OAc, H resp.) (IV, V, VI, VII, VIII, IX) showed that the oxo group is either at position 21 or preferably at position 22. The positions of cleavage of the ions of derivs. II-IX, the elucidation of which led to the assignment of the position of the oxo group, are indicated and the masses of the resultant fragment ions were tabulated. Further evidence that the position of the oxo group was in ring E was provided by study of the mass spectra of compds. V, VI, VII, and VIII. A marked difference was observed between the mass spectra of the equatorial and axial epimers of compds. VI, VII, and VIII. Although the position of peaks (except M-15 peaks) were the same, there were significant differences in relative intensities between corresponding

peaks at equal mass positions. The results were explicable in the light of the more ready formation of a cyclic transition state in the ion from the equatorial acetate compared with the ion from the axial compd.

L26 ANSWER 118 OF 126 CA COPYRIGHT 2001 ACS

OREF 52:5895f-g

TI Surface ionization mass spectrometer for production control

AU Echo, M. W.; Morgan, T. D.

CS Phillips Petrol. Co., Idaho Falls, Ida.

SO Anal. Chem. (1957), 29, 1593-5

AB A mass spectrometer with a surface ionization source has been developed. It is based on a 12-in. radius, 60° type of instrument utilizing the vacuum-lock principle. The instrument has been used for production criticality control and accountability of U.

L26 ANSWER 120 OF 126 CA COPYRIGHT 2001 ACS

OREF 51:774i, 775a

TI Vacuum lock for a mass spectrometer solids entry system

AU Roberts, R. H.; Walsh, J. V.

CS Dow Chem. Co., Denver, CO

SO Rev. Sci. Instr. (1955), 26, 890

AB cf. C.A. 50, 14402c. A vacuum lock is described for use in conjunction with a 180° analyzer tube, which had simplicity of operation, min. maintenance, reliability, and low initial cost. Construction details of the app. are given. The total time required to introduce a sample and obtain a vacuum of  $6 \times 10^{-7}$  mm. of Hg was 25 min. The lock consisted essentially 775 of an inlet section, a stopcock, and an analyzer extension. A probe-type oven was used.

L26 ANSWER 126 OF 126 CA COPYRIGHT 2001 ACS

OREF 47:7885e-f

TI Vacuum lock for routine solid analyses with a mass specrometer

AU Stevens, Charles M.

CS Argonne Natl. Lab., Chicago

SO Rev. Sci. Instr. (1953), 24, 148-51

AB A vacuum lock is described for mass-spectrometric analyses of solids requiring high resolution. This lock is incorporated in a 60° mass spectrometer and consists essentially of a long shaft having 3 sections. The sample is placed in an end section, and each section is pumped with increasing vacuum toward the mass spectrometer. Analyses can be made 5-10 min. after introduction of the sample. With a surface ionization source, 6-8 samples can be analyzed in an 8-hr. day.

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